month. Neither of these would be convenient; the first is, for other reasons also, inadmissible.

On one point we agree with Mr. Pearce, and that is as regards the incidence of Easter. There is a common, but false, impression that the existing cumbrous arrangement has the authority of the Council of Nicæa. All that that council decreed was, in opposition to the so-called Quartodecimans, that Easter should always be kept on a Sunday; the particular Sunday was regulated by various cycles, the Metonic being usually followed, and the present rule was initiated by the advisers of Pope Gregory XIII., the English Prayer-Book rule arriving at the same end, when our calendar was reformed, by a slightly different process. It has not secured uniformity in Christendom because the Eastern church still follows the Julian calendar, and therefore its Easter is usually different from ours. A rule to keep Easter on the second Sunday in April (when the first Easter in all probability fell) would be very convenient, but it is an ecclesiastical question, and the alteration should be the act of the whole church. To make it always on the same day of the month, as well as week, as Mr. Pearce proposes, could not be done without accepting his other drastic and inadmissible proposals.

W. T. L.

PECULIARITIES IN THE STRUCTURE OF SOME HEAVENLY BODIES.

PROF. SUESS has recently contributed a suggestive paper on peculiarities in the structure of some of the heavenly bodies [1] to the Academy of Sciences of Vienna. He remarks at the outset that the present phase of geology is similar to that of anatomy at the time when the structure of the human body was first compared with that of other living organisms. For the purpose of comparative study it is essential that the earth should be regarded as a whole, and when this is done it becomes fairly obvious that acid rocks and their derivatives, which form so large a portion of the visible surface, are far less important as constituents of the globe than might at first sight be supposed. We see but little of those heavy substances to which the earth owes its high density, and which appear to be more closely associated with the basic than with the acid rocks. Our author considers that for the general purpose which he has in view three main types of rock should be recognised—SiAl rocks (sal or salic rocks), SiMg rocks (sima or simic rocks), and NiFe rocks (nife or nific rocks). For the simic rocks containing chromium and iron he uses the term crofesima. The most important occurrences of platinum are in the crofesimic rocks, which also contain almost always traces of nickel. These rocks are of deep-seated origin, and it is a significant fact that they frequently occur as intrusions along planes of movement in the younger mountain chains, such as the Alps, *e.g.* zone of Ivrea.

In 1901 the author, in a letter to Sir Norman Lockyer (NATURE, October 24, 1901, p. 629), directed attention to the fact that the metals associated with the basic rocks are not only distinct from those which often accompany the acid rocks, but that they agree closely with those which stand out prominently in the Fraunhofer spectrum and in α Cygni. This led Sir Norman to institute a special research, with the result [2] that "the views of Prof. Suess were confirmed . . . and that the metals conspicuously represented in the spectra of the sun, the chromosphere, and α Cygni are, in the main, those which are associated with basic rocks; also that, with the possible exception of yttrium and lithium, the metals typical of acid rocks are not represented in α Cygni. There is, of course, evidence that several of the acid-rock-metals such as potassium, beryllium, cerium, tin and zirconium are represented in the Fraunhoferic spectrum, but the solar lines are in each case inconspicuous."

Commenting on the above quotation, Prof. Suess points out that if the composition of the earth be considered quantitatively there is every reason to believe that it would, if subjected to the necessary physical conditions, yield a sun in which the basic group of metals would spectroscopically dominate over the acid group.

In considering the distribution of metals of the basic, or, as he now expresses himself, of the simic group, the author directs attention to the local predominance in terrestrial occurrences of certain metals, *e.g.* titanium over nickel and *vice versâ*. Similarly, if γ Cygni be compared with α Cygni, titanium, strontium, and scandium will be seen to be more important, and iron, chromium, and magnesium less important in the former than in the latter.

The special importance of titanium in sun-spots is compared with the predominance of this metal (ilmenite) over nickel in the contents of the diamond-pipes of South Africa, which are regarded as the most striking terrestrial examples of gaseous eruptions.

In the concluding part of the paper the author briefly reviews the theories as to the origin of meteorites, and favours the view that they, together with the planetoids, represent the fragments of an anonymous planet which formerly occupied a position between Mars and Jupiter. "The centre of this planet," he says, "consisted of nife like that of Agram or Elbogen. Towards the exterior the proportion of magnesium increased, and a transition from nife to sima took place, as is probably the case with the earth, although the supposition cannot be verified by observation. A salic outer crust was absent unless it be represented by the perfectly molten tektites." [1]

SIR JOHN ELIOT, K.C.I.E., F.R.S.

THE news of the death of Sir John Eliot, K.C.I.E., F.R.S., in his sixty-ninth year, at his residence, Bon Porto, Cavalaire, Var, France, will be received with great regret by a very large circle of friends. His death was extremely sudden, and took place in the early morning of Wednesday, March 18. He was walking on a steep hill in his own grounds, superintending the work of his men, when he suddenly sat down and passed away. The cause of death is said to have been apoplexy.

Sir John Eliot was throughout his life a most indefatigable worker, and since his retirement from the Indian Service about five years ago he had continued to work with unabated vigour. Indeed, the strenuous work which he undertook may perhaps have undermined his health, and have caused his premature death. He was one of the most genial companions possible, having a most charming personality, together with a keen sense of humour. He was most widely read and well informed in almost every subject, and at the same time he was one of the most modest of men. He was a most accomplished musician, and played the organ and piano with very great execution and feeling. He was also greatly loved and esteemed by his subordinates and fellow-workers, and by his many friends.

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[1] "Über Einzelheiten in der Beschaffenheit einiger Himmelskörper" (*Sitz. a. k. Akad. d. Wiss. Mathem-naturw. Klasse*, Bd. cxvi., October, 1907.)

[2] "Spectroscopic Comparison of Metals present in Certain Terrestrial and Celestial Light-sources." (Solar Physics Committee, 1907.)

[1] This term has been proposed by Dr. F. E. Suess ("Die Herkunft der Moldavite und verwandter Gläser," *Jahr. geol. Reichsanst.*, 1900, p. 193) for certain peculiar vitreous bodies which he refers to an extra-terrestrial origin.

Sir John Eliot had a most distinguished career, and the major part of his life was devoted to India, at first to educational work, and later on to Indian meteorological problems. He was born at Lamesby, in Durham, on May 25, 1839. The details of his earlier education have not been recorded, but he went up to Cambridge University about 1866 and took his degree from St. John's College in 1869, and was second (bracketed) wrangler and first Smith's prizeman of his year. He was then elected to a fellowship at St. John's College, which he held from 1869 up to his marriage in 1876. As a young man his health was not very robust, and he was advised to avoid the climate of England, so that after taking his degree he accepted an appointment in the Indian Government Service as professor of mathematics at the Roorkee Engineering College. This he held from 1869 to 1872. He was then transferred to the regular Indian Educational Service as professor of mathematics at the Muir Central College at Allahabad, an appointment which he held from 1872 to 1874.

About this time he turned his special attention to physics rather than to pure mathematics, and also undertook certain meteorological work at Allahabad. In 1874 he was appointed professor of physical science at the Presidency College, Calcutta, and combined this with the post of meteorological reporter to the Government of Bengal, both of which he held from 1874 to 1886. He was then appointed meteorological reporter to the Government of India and director general of Indian observatories, an appointment which he held until he retired in January, 1903. On his retirement the Government of India published in the *Gazette of India* a most complimentary resolution thanking him for "his long and meritorious services."

As an educationist he has left his mark in the various colleges in India in which he worked, and also in the Calcutta University, of which he was for many years a most distinguished Fellow. Many of the present generation of educated Indian gentlemen who are holding very prominent positions are largely indebted to Sir John Eliot, not only for his actual teaching, which was of a particularly high order, but also for his kindliness and sympathy towards his students. The example shown by his work and character had a great effect on all brought in contact with him, and he was very greatly respected and loved by his students and by all classes of Indian gentlemen, for it may be truly said of him that his great abilities were more than equalled by his extreme modesty and invariable kindness.

In his capacity as Fellow of the Calcutta University he also did very notable work, and by his great influence and marked powers of persuasion he was able to introduce many considerable reforms into the courses of instruction in mathematics and physical science, and in the latter case he was specially successful in making the courses more practical and more thorough than they had hitherto been.

As a meteorologist, India also owes him a large debt of gratitude. As meteorological reporter to the Government of Bengal, he largely extended the meteorological system, and introduced daily weather reports with charts based on telegraphic information, and he also instituted a very comprehensive and effective system of storm warnings for coast stations round the Bay of Bengal, and of flood warnings for inland stations. One of his earliest meteorological papers was a "History of the Backergunge Cyclone of 1876," in which storm about two hundred thousand people were drowned in about half an hour by a huge storm wave, which swept over the Island of Sandip.

In this monograph Sir John Eliot largely developed and extended the theory of the formation of cyclones. This publication indeed excited a good deal of attention both in India and in England, and in both instances this was unusual. So much attention was directed to this memoir and to the cyclone which it described that a request was made in the House of Commons for the report to be produced and laid on the table, and it was then made available to those interested in England.

The reputation as a meteorologist which Sir John Eliot gained while occupying the post of meteorological reporter to the Government of Bengal rendered it a foregone conclusion that when the higher post of meteorological reporter to the Government of India fell vacant it would be offered to him. This post had been created about the year 1875 or 1876, and its first incumbent was the late Mr. H. F. Blanford, F.R.S. Up to about 1875 there had only been local officers in charge of the meteorology of the different provinces (such as Bengal, Madras, and Bombay) into which India is divided, but it was felt that if Indian meteorology was to make any real progress it must be studied as a whole, and not piecemeal. Hence the appointment of meteorological reporter under the Imperial or Indian Government was created, and all the observations taken in the various provinces were, after local use, sent on to the Indian Meteorological Department. Much and most valuable work was done by Mr. Blanford in the development of the department on an Imperial basis, and also in the foundation of systematic and organised investigation and in the prompt diffusion of meteorological information thus obtained, but, as in all great schemes, the progress of consolidation of the work in its imperial aspects was rather difficult.

With Mr. Blanford's work as a basis, Sir John (then, of course, Mr.) Eliot was able to make more rapid progress. He largely increased the area from which observations were received, and also the number of reporting stations in the area already covered. Indeed, during his tenure of office he almost doubled the number of stations which sent in reports, and extended them so as to get observations from very high altitudes (11,000 feet elevation), and also from outlying places like Kashmir and the routes leading towards Central Asia, and from such places as Leh, Ladakh, Dras, &c. He made the work of the observatories more accurate and more systematic, and arranged that by telegraphic communication the latest meteorological information from all parts of the Indian Empire in the form of daily weather reports with charts should be at once available at headquarters.

Indeed, it is not too much to say that from the time he took over charge of the Indian Meteorological Department, its efficiency and usefulness were very largely increased, and that he brought it quite into line with the most modern meteorological organisations. Under him the department published many series of most valuable results and memoirs. He also developed a complete system of storm warnings for the whole of the coast-line of India and Burma, extending over some thousands of miles, and also established flood warnings for the whole of India by which telegraphic warnings are sent of expected floods to all engineers in charge of irrigation and other large works, and in other cases where similar damage may occur. Daily reports with charts dealing with the sea areas of the Bay of Bengal and Indian Ocean were also established, and, further, he established a most valuable system of seasonal forecasts, which gradually became of very great value, though naturally to begin with they were rather tentative and experimental.

Those who navigate Indian seas are also especially indebted to Sir John Eliot for his work, "Handbook of Cyclonic Storms in the Bay of Bengal," which has in all human probability been the means of saving many vessels and valuable property—possibly from destruction and certainly from damage—by enabling such vessels, by the rules laid down in that work, to avoid the more dangerous parts of these cyclones, and also generally to escape from them altogether by the knowledge thus given of the indications of the approach of such storms and of the tracks usually followed by them in the different months of the year.

Indeed, it would be an easy matter to prove that in many instances the information and warnings conveyed from the Indian Meteorological Department have been the means of helping that Government and individuals in a most remarkable manner, and that even to put the matter on the lowest ground, it has saved the State vast sums of money by giving accurate information of the precise meteorological conditions of the country, and timely warnings of possible famines, and in some cases, when famine seemed looming in the immediate future, of timely information of approaching rainfall, which at once would do away with the necessity of starting famine relief operations on a large scale. The Indian Meteorological Department has far more than justified its existence, for it has really proved itself of far greater value than its relatively small cost.

Sir John Eliot was also very greatly interested in the subject of solar physics, and he was largely instrumental in starting the solar physics observatory at Kodaikanal, in southern India, and immediately on his retirement he was appointed as a member of the Solar Physics Committee, and also on other scientific bodies, and he worked quite as hard as he had always done in India. Indeed, he was at work up to the last, for on the Monday before his death he was engaged on his new book, "A Handbook of Indian Meteorology," and said he was making great progress with it.

One who knows well the work of Sir John Eliot after his return to Europe writes as follows:—

"Sir John Eliot left India full of enthusiasm for the future of his department. As a public servant he had the rare satisfaction of knowing that a scientific enterprise begun with some doubt and misgiving, had, under his direction, established its claim to a recognised position, and had justified the anticipations of its promoters. His last official step was to secure for his successor the increase of the scientific staff of which he had himself felt the need.

"On his return to England he gave expression to his experience and his aspirations in an address to the British Association at Cambridge in 1904 as president of the subsection for astronomy and cosmical physics. Reviewing his own work and stimulated by his success, he looked beyond the forecasts of to-morrow's weather to anticipating, on strictly scientific grounds, the character of the seasons by the correlation of meteorological phenomena over extended regions of the earth and their possible relation with solar changes. He became secretary of the Solar Commission, originated upon the proposition of Sir Norman Lockyer by the International Meteorological Committee, which met at Southport in 1903. The purpose of the committee was to collect comparable meteorological data from all parts of the world and solar data for comparison with them. He spent a considerable part of his last stay in England in planning new arrangements for carrying out the objects of the Commission. In the latter part of his address at Cambridge he advocated the organisation of the British contribution to this side of meteorological work upon an imperial basis. He realised that an imperial combination would treat such questions with a breadth of view that is not possible or permissible in any single colony or dependency, guided, as it must be, by the narrower consideration of its immediate needs.

"His plan was to provide for organised observations from areas too wide to be within the control of any single Government; to place the material thus obtained at the service of workers in all parts of the world by publishing it while it was still of direct practical utility and to ensure its application to the service of the Empire by a special staff of trained workers.

"Anyone who reads the address cannot fail to catch something of his enthusiasm. There is a ring of the "land of hope and glory" about his appeal for the extension of our knowledge of the facts. "Wider still and wider be thy boundaries set" bespeaks the ideal of his meteorological method, and it was to the various parts of the King's dominions that he looked for its realisation. The task was no light one. The British Association made a beginning, but imperial wheels grind very slowly. It says much for Eliot and for India that he carried with him the active support of the Indian Government for the proposal. He welcomed the idea of a meeting of British meteorologists in Canada, because it gave him the opportunity of getting a step forward, and although conscious of the personal sacrifice which it involved, he undertook to make the journey to Ottawa this year for the purpose. The intention cannot be fulfilled."

"It is a bitter disappointment to all his fellow-workers that death has brought his efforts to an untimely end. His enthusiasm was entirely free from any suggestion of selfishness or personal ambition; he could speak from an unique position with unrivalled experience. There is no one now to take his place. But the idea remains, and this country seldom wants for men when there is real work to be done. Remembering Eliot's achievements we are emboldened to fall back upon the refrain, and to add the second couplet without misgiving."

Among the more prominent of Sir John Eliot's publications are numerous accounts of cyclones and severe cyclonic storms occurring within Indian seas; also numerous meteorological discussions contributed to the Indian Meteorological Memoirs, to the Indian Cyclone Memoirs, to the Journal of the Asiatic Society of Bengal, and to the Quarterly Journal of the Royal Meteorological Society; his "Handbook of Cyclonic Storms in the Bay of Bengal" (already mentioned), and his last publication, which took the form of that most valuable work, "The Climatological Atlas of India," published by the authority of the Government of India only a few months ago; while at the time of his death he was engaged in writing a "Handbook of Indian Meteorology" to accompany this, also to be published under the direction of the Government of India.

Sir John Eliot was elected a Fellow of the Royal Society in 1895; he was created a C.I.E. in 1897, and was given his K.C.I.E. in 1903 on his retirement. In 1877 he married Mary, daughter of Mr. Wm. Nevill, of Godalming; his widow survives him, and he has left three sons. A. P.

NOTES.

SIR OLIVER LODGE was unable to deliver his presidential address to the Faraday Society on Tuesday on account of an attack of influenza, from which, however, he is now recovering.

WE regret to state that the Duke of Devonshire died at Cannes on Tuesday morning, at seventy-four years of age. The Duke was a Fellow of the Royal Society and Chancellor of the University of Cambridge.